

What is a Database

“A database is a collection of related data”. Elmasri, R. & Navathe, S.B. 2001

“Database is a collection of data, or information, that is specially organized for rapid search and retrieval by a computer.” Encyclopaedia Britannica

“A collection of persistent data that can be shared and interrelated.” Manino, M. 2007

Properties of Databases

Persistent means that data reside on stable storage such as a database server hard disk drive or a database serve cloud.

Shared means that a database can have multiple uses and users.

Interrelated means that data stored as separate units can be connected to provide a whole picture, to order data and facilitate order processing

Database Management Systems

“A database-management system (DBMS) is a collection of interrelated data and a set of programs to access those data. The collection of data, usually referred to as the database, contains information relevant to an enterprise. The primary goal of a DBMS is to provide a way to store and retrieve database information that is both convenient and efficient.” Silberschatz, A., Korth, H. F. & Sudarshan, S. 2011

“A database management system (DBMS) is a collection of programs that enables users to create and maintain a database. The DBMS is a general-purpose software system that facilitates the processes of defining, constructing, manipulating, and sharing databases among various users and applications.” Elmasri, R. & Navathe, S.B, 2011

“A database management system (DBMS) is a collection of components that supports the creation, use, and maintenance of databases. It provides a broad range of features for data acquisition, storage, dissemination, maintenance, retrieval, and formatting. ” Manino, M. 2007

Relational Databases

- A relational database consists of a collection of tables, each of which is assigned a unique name.
- Represents the database as a collection of relations
- gives us a single way to represent data: as a two-dimensional table

Basic Elements of Relational Databases

Tables or Entities:

Represent real-world objects or concepts

Are assigned unique names

Attributes:

An attribute describes the meaning of entries in the column below.

Refers to a column of a table or column names.

Represent some properties of interest that further describes an entity

Tuples or Rows:

These are a sequence or list of values.

Sometimes are called Records

Domains or Data Type

Data types indicate the kind of data (character, numeric, Yes/No, etc.) and permissible operations (numeric operations, string operations etc.) for the column.

Table Name or
Entities or

Relation Name

STUDENT

Attributes

Rows
or
Records
or
Tuples

Name	Ssn	Home_phone	Address	Office_phone	Age	Gpa
Benjamin Bayer	305-61-2435	(817)373-1616	2918 Bluebonnet Lane	NULL	19	3.21
Chung-cha Kim	381-62-1245	(817)375-4409	125 Kirby Road	NULL	18	2.89
Dick Davidson	422-11-2320	NULL	3452 Elgin Road	(817)749-1253	25	3.53
Rohan Panchal	489-22-1100	(817)376-9821	265 Lark Lane	(817)749-6492	28	3.93
Barbara Benson	533-69-1238	(817)839-8461	7384 Fontana Lane	NULL	19	3.25

ENTITY NAME: Movie

Attributes

Rows
or
Records
or
Tuples

<i>title</i>	<i>year</i>	<i>length</i>	<i>genre</i>
Gone With the Wind	1939	231	drama
Star Wars	1977	124	sciFi
Wayne's World	1992	95	comedy

Movies(title:string, year:integer, length:integer, genre:string)

Domain
or
Data Type